

Amendment to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A method for fueling an internal combustion engine, comprising the steps of:
 - a) providing a first fueling system for selectively metering a hydrocarbon fuel to said engine;
 - b) providing a second fueling system for selectively metering a hydrogen-containing fuel gas to said engine; and
 - c) selecting and controlling a ratio of amounts of hydrocarbon fuel and hydrogen-containing fuel gas provided by said first and second systems to said engine during an engine steady-state operating condition.
2. (Original) A method in accordance with Claim 1 wherein said hydrocarbon fuel is selected from the group consisting of gasoline, diesel fuel, and ethanol.
3. (Original) A method in accordance with Claim 1 wherein said hydrogen-containing fuel gas is hydrocarbon reformat.

4. (Original) A method in accordance with Claim 1 wherein said hydrogen-containing fuel gas is hydrogen gas.

5. (Currently amended) A method for fueling an internal combustion engine with a hydrocarbon fuel and a hydrogen-containing fuel gas, comprising the steps of:

a) starting said engine on a mixture of said fuel and said fuel gas wherein at least 90% of the motive energy of said engine is derived from said hydrogen-containing fuel gas; and

b) progressively changing the supply ratio between said hydrocarbon fuel and said hydrogen-containing fuel gas such that, when said engine reaches an equilibrium operating temperature, an optimum fraction of the motive energy of said engine is derived from said hydrocarbon fuel and said hydrogen-containing fuel gas.

6. (Currently amended) A method in accordance with Claim 5 wherein said optimum fraction is at least 90% hydrocarbon fuel.

7. (Original) A method in accordance with Claim 5 wherein 100% of the motive energy of said engine is derived from said hydrogen-containing fuel gas during said starting of said engine.

8. (Currently amended) A method in accordance with Claim 5 further comprising a first step of cranking said engine on a mixture of up to 100% of hydrogen hydrocarbon fuel prior to said starting step, to optimize engine start time.

9. (Original) A method in accordance with Claim 5 wherein said supply ratio is optimally changed to minimize levels of unburned hydrocarbons in an exhaust stream of said engine.

10. (Original) A method in accordance with Claim 5 wherein said supply ratio is changed by adding hydrocarbon fuel to provide a second engine torque that exceeds a first engine torque that said optimum fraction can provide.

11. (Currently amended) A system for fueling an internal combustion engine with a hydrocarbon fuel and a hydrogen-containing fuel gas, comprising:

- a) a hydrocarbon fuel supply system; and
- b) a hydrogen-containing fuel gas supply system, wherein said engine is fueled by an optimum fraction of hydrogen-containing fuel gas at engine start-up and at engine steady-state operating conditions.

12. (Original) A system in accordance with Claim 11 wherein said hydrogen-containing fuel gas supply system is a pressure vessel.

13. (Original) A system in accordance with Claim 11 wherein said hydrogen-containing fuel gas supply system is a hydrocarbon fuel reformer.

14. (Original) A system in accordance with Claim 11 further comprising a control system for regulating relative supply of said hydrocarbon fuel and said hydrogen-containing fuel gas at any given time.

15. (Original) A system in accordance with Claim 14 wherein an amount of hydrogen-containing fuel gas supplied to said engine is in a range between 0% and 100%.

16. (Original) A system in accordance with Claim 11 wherein said hydrogen-containing fuel gas is hydrocarbon reformat, and wherein said hydrogen-containing fuel gas supply system includes a hydrocarbon catalytic reformer.

17. (Original) A system in accordance with Claim 16 wherein said reformer includes means for combustive preheating of catalytic elements in said reformer.

18. (Original) A system in accordance with Claim 16 wherein said hydrocarbon fuel supply system and said hydrogen-containing fuel gas supply system are each supplied with hydrocarbon fuel from a common hydrocarbon fuel reservoir.

19. (Original) A system in accordance with Claim 16 wherein said engine is fueled at least 90% by said reformat at engine start-up and by an optimum fraction of hydrocarbon fuel at engine steady-state operating conditions.

20. (Original) A system in accordance with Claim 19 wherein said optimum fraction is at least 90%.

21. (Currently amended) An internal combustion engine fueled by a hydrocarbon fuel and a hydrogen-containing fuel gas, said engine comprising:

- a) a hydrocarbon fuel supply system; and
- b) a hydrogen-containing fuel gas supply system, wherein said engine is fueled by an optimum fraction of hydrogen-containing fuel gas at engine start-up and at engine steady-state operating conditions.

22. (Original) An engine in accordance with Claim 21 further comprising a control system for regulating relative supply of said hydrocarbon fuel and said hydrogen-containing fuel gas at any given time.

23. (Original) An engine in accordance with Claim 22 wherein said engine is fueled at least 90% by said hydrogen-containing fuel gas at engine start-up and by an optimum fraction of hydrocarbon fuel at engine steady-state operating conditions.

24. (New) A method in accordance with Claim 1 further comprising cranking said engine on a mixture of up to 100% of hydrocarbon fuel to optimize engine start-up time.

25. (New) A method in accordance with Claim 1 wherein said amounts of hydrocarbon fuel and hydrogen-containing fuel gas are provided to said engine at engine start-up.